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# Continuous process for the decantation and the preparation of cane sugar juice in a company.

Application 46040 . . . etc.

This invention concerns a process for the decantation and the preparation of cane sugar juice in a continuous mode.

The pollutants present in the cane sugar based juice are generally difficult to decant. The reason for this is that this juice contains, apart from sand, a significant amount of lighter elements, especially fibres of ... ampas, as well as gummy matter. These light floating pollutants deposit on the decantation apparatus, even when the decantation surfaces have steep slopes, so that after a certain time, the decomposition of these deposits will make the juice turn sour.

This drawback is not encountered in tanks that do not operate in a continuous mode, in which the juice rests for a long enough period of time, since these tanks can be cleaned after each use after having emptied them.

To counter the light pollutant residues in the continuous mode decantation apparatus, scraping instruments were adapted to wipe the filth off of the decantation surfaces (Petree Dorr apparatus). The scraping apparatus will make the already decanted fine particles swirl and thus make a complete decantation impossible, so that the juice remains murky.

The invention aims to avoid these drawbacks of continuous mode decantation and to proceed so that the difficult to decant light dirt cannot deposit itself, but instead gets swept along with the heavier dirt already decanted.

According to the invention, the juice is poured from the top into the pre-chamber of a rectangular vat with a simple inclined bottom of constant width; in this pre-chamber, the floating pollutants are separated, while the juice is directed in an almost horizontal direction above the inclined bottom. The juice then goes over the bottom, between a series of parallel walls, towards the discharge openings, where the speed of the juice, after the pre-chamber decreases near the end of the bottom, where the sediment is transported.

The juice is heated sufficiently to further favour the separation of the floating pollutants in the pre-chamber, and at the same time, to prevent patches of sediments from forming.

It is indicated that, decantation apparatus with decantation slopes have already been proposed for water purification (see German patents 256,153 and 395,204 and the British patent 9602 A.D. 1896). These known apparatus cannot be used for the purification of cane sugar juices, because of their design, their outlets get plugged with the dirt. Such plugging causes the lighter pollutants to deposit away from the outlet. This is not detrimental for the liquid (in the case of water), but it is unacceptable for cane sugar juice, as far as its acidification is concerned.

On the drawing, there is a layout for the execution of the process according to the proposed invention.

Figure 1 is a vertical longitudinal section view.
Figure 2 is a cross-sectional view along line 22 in figure 1.

The cane sugar juice to be treated, flows continuously from a pipe (1) and arrives into the pre-chamber (2) of the decantation vat (3) where the bottom (4) is practically of constant width everywhere and inclined towards the outlet (5) for the sediment.

There are a number of outlet openings (6) in the upper part of the vat (3), from which the purified liquid matter can evacuate. These openings are located between the vertical walls (7) which form the chambers (8).

The floating elements remain in the pre-chamber (2). The liquid matter moves around in this chamber while at the same time, the heavy and light particles move around at the bottom. The heavy particles flow, for the most part, directly to the bottom, after the liquid has entered the vat underneath the pre-chamber (2). They then slide along the bottom plate (4) in parallel directions. On the other hand, the lighter particles are retained for a longer period of time in the flow. Since the speed of the flow decreases immediately after the pre-chamber (2), the lighter particles also have the opportunity to decant and finally reach the outlet (5). The smaller the weight of the pollutant, the farther it will be from the chamber (2) when it will reach the bottom (4). The pollutants cannot latch on to the bottom, since they are continuously dragged along by the heavy particles sliding at the bottom, which is of the same width everywhere and because the pollutants cannot escape. The liquid is discharged from the barrel by the openings (6).

There can also be openings (9) located lower than the openings (6). These openings (9) are covered with a filtering gauze (metallic grid), filtering screens or other filtering layers.

These filters help retain the dirt that had not decanted and that was still being transported. Vertical filters can also be placed in front of the openings (6) to perform the same function.

Of the vertical walls (7), the first wall (7), which is the one that borders the pre-chamber (2), is particularly important because it pushes the current towards the bottom. The second wall is intentionally made shorter in order to avoid clogging at that spot where the speed (of the current) is still quite high. The length of the walls can be much greater at the spots where the speed has already decreased. The lower part of the second, third and fourth walls (7) can also be located in a plane parallel to the inclined bottom. The walls (7) favour a regular flow of the clarified juice and make the flow towards the top more regular.

A heating apparatus (10) can be installed in the pre-chamber (2). The usual patches of sediments, can thus no longer occur because the juice is heated inside the

decantation apparatus. Moreover, the heating in the pre-chamber gives an ascending flow, which favours the separation of the ingredients.

## Conclusion

Process for the functioning in a continuous mode of the decantation and clarification of cane sugar juice, in which the juice is brought from the top into the pre-chamber of a rectangular vat with a simple inclined bottom of constant width, in which pre-chamber the floating ingredients are separated, while the juice is then directed into an almost horizontal direction above the inclined bottom, and rises above the bottom between a certain number of parallel walls towards the outlet openings, where the speed of the juice after the pre-chamber decreases towards the end of the bottom where the residue is discharged.